2018

Influence of information and communication technology on knowledge sharing in research organizations: a case of centers for disease control and prevention in Kenya

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INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGY ON KNOWLEDGE SHARING IN RESEARCH ORGANIZATIONS: A CASE OF CENTERS FOR DISEASE CONTROL AND PREVENTION IN KENYA

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094880

Thesis submitted to the School of Management and Commerce in partial fulfillment of the requirements for the degree of Master of Commerce

School of Management and Commerce

Strathmore University

Nairobi, Kenya

June, 2018

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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DEDICATION

To my parents Francis and Lucy Mugo and Son Alvin Mugo For always giving me reason to go the extra mile.

ACKNOWLEDGEMENTS

My first gratitude is to God for the gift of life, good health of mind and body and Strathmore University for according me the opportunity to undertake this study.

Secondly, I acknowledge the invaluable guidance and support accorded to me by my supervisor Dr. Tabitha Waithaka. She has availed her time and provided insightful comments and guidance of which I am thankful. I am also thankful to all lectures who taught me in the course of my studies for influencing my thinking and thesis.

Lastly, I acknowledge the love and compassion accorded to me by my entire family and for providing an enabling environment for undertaking my studies. Special thanks to my father Francis Mugo, my mother Lucy Mugo, Alvin Mugo and all my siblings. I am also grateful for the invaluable support and encouragement I received from my classmates Rosemary Njigua, Terry Kimotho and Jennifer Leting. I am grateful to all those who participated in the research process. Thank you.

ABSTRACT

Research organizations are in the core business of discovering new knowledge and developing existing knowledge. Knowledge sharing ensures value creation of the knowledge asset and ensures research organizations maintain their competitive advantage. Knowledge sharing occurs through creation of social networks that create an environment that allows for sharing of knowledge between individual and social units. Organizations adopt information and communication technology in order to provide an avenue that allows for social networking regardless of time and distance. The purpose of the study was to analyze the influence of information and communication technology on knowledge sharing with interest on the ICT elements of tools, infrastructure, competencies and infrastructure.

The target population of 172 employees working for the Centers for Disease Control and Prevention in Kenya provided the primary data that was collected through questionnaires. Multiple regression analysis, descriptive statistics and correlation analysis were used to examine the data. Results indicate that ICT infrastructure and ICT structure was significant in explain knowledge sharing in research organizations. The study however had limitations, in that it did not look at other organizational factors besides ICT that influence knowledge sharing like people and processes. The research was carried out over a period of seven months from November 2017 and May 2018.

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ABBREVIATIONS AND ACRONYMS

CDC	Centers for Disease Control and Prevention
HHS	Department of Health and Human Services
ICRAF	World Agroforestry Center
ICT	Information and Communication Technology
KM	Knowledge management
KMS	Knowledge management systems
SPSS	Statistical Package for Social Sciences
TAM	Technology acceptance model

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Knowledge and ultimately knowledge development has assumed an increasingly important role with what used to be information management becoming knowledge management in the knowledge society (Huysman & de Wit, 2013). Servin (2005) posits that the overall performance of any organization is often greatly linked to its capacity to assemble all the available knowledge resources held by teams and persons but also its capacity to transform the resources into value generating activities. Knowledge sharing is an important way through which employees are involved in knowledge application, innovation and the creation of competitive advantage of an organization while further allowing them to efficiently exploit available knowledge-based resource (Jackson, Harden, Jiang & Joseph, 2006).

Research organizations are considered to be of strategic importance as they are involved in the core business of discovering new knowledge and developing existing knowledge (InnoviSCOP, 2016). Knowledge sharing is believed to occur when there's voluntary transfer of experiences, ideas, skills and insights from one person to another (Turban, Aronson& Liang, 2005). Organizations have to develop strategies such as adoption of information and communication technology (ICT) that help them reap the rewards of knowledge sharing in order to remain competitive because knowledge that does not flow does not grow and eventually ages and becomes obsolete and useless (Borgdoff, 1997). Joshi, Meza, Costa, Puricelli, Trout and Rayamajih (2013) posit that the key elements of ICT lie in its ability to incorporate electronic technologies and techniques that can be used to manage information which includes tools used to store, process, distribute and exchange information. The ICT elements that have significant influence on knowledge sharing are: ICT tools, ICT structure, ICT infrastructure and ICT competency/skills or know how (Nguyo, 2015; Mulwa, 2012; Wheeler and Valacich, 1996; Dwumfuo and Kommey, 2013).

Nonaka and Takeuchi (1995) classify knowledge either as explicit knowledge or tacit knowledge. Explicit knowledge is more formal in nature and is packaged as information that can be found in an organization's documents that include manuals, patents, articles, reports,

videos, sounds and soft wares. This category of knowledge is often easy to archive and retrieve when a need arises and is considered as an organization's knowledge asset independent of its employees. Tacit knowledge, on the other hand, is the practical knowledge that comes from personal experience of getting the job done (Borghoff, 1997). This form of knowledge is often neglected with its value acknowledged when specific key employees leave or are unable to execute their work (Borghoff, 1997). The increased recognition of knowledge as an asset whose value is seen as being at par with other factors of production such as capital, land and labor has led to the advancement of knowledge management with the intention of ensuring that organizations are able to generate and share knowledge efficiently and effectively (Rollet, 2003).

Proponents of knowledge sharing outline the significant outcome of the knowledge sharing process as employee development, team work and cross-functional cooperation (Sveiby, 1997; Ghobadi and D'Amara, 2012; Soto-Cegarra-Navoro, 2016; Iqbal, Toulson and Tweet, 2015; Wickramasinghe and Widuaratne, 2012) .The attainment of the advantages that come from knowledge sharing can be done by proper implementation of knowledge management motivators which are instruments for organizations to stimulate creation, sharing and protection of knowledge within the organization (Ying-Jung, Sun-Quae & Chin-Tsang, 2006). In addition, sharing tacitly held knowledge is not only naturally hard but to a large extent voluntary. Developments in the field of ICT make it possible for organizations to achieve the goals set for knowledge sharing. Huysman and de Wit (2013) however emphasize that achievement depends on a collection of other factors such as the benefit for a person to share knowledge with others, combined participation in the organization and the correct use of ICT. Refusal or unwillingness to use ICT or lack of training is among other factors that make it challenging for organizations to get rewards of knowledge sharing.

The association between information and communication technology and knowledge sharing has been observed in several studies with authors anchoring their studies on the social capital theory, resource based theory and the technology acceptance theory. Nguyo (2015) found strong correlation between elements of ICT and knowledge sharing in the Kenyan state corporations. Nchunge, Sakwa and Mwangi (2013) concluded that acceptance of ICT in

Kenyan secondary schools was low citing ICT competency, inadequate infrastructure, high costs of funding such programs and insufficient policy framework as a barrier. Muhoya (2016) agrees that while technology plays a role in knowledge sharing, it is often not fully utilized due to other organizational factors like culture and strategy limitation. Nzui (2014) carried out a study at the World Agroforestry Center (ICRAF) and found that in the research institution, ICT has a major influence on the capturing, storing and application of knowledge. The author highlighted the need for further research on the influence of ICT on knowledge management process in a number of research organizations in Kenya in order to test the scope of the influence on purely knowledge organizations.

Academics have called for caution on the part of managers as far as making financial investment in technology at the expense of people while acknowledging the importance of information and communication technology on knowledge sharing (Sveiby, 1997). The exact association of ICT and knowledge sharing in research organizations remains unclear hence the need for this research which sought to find out the influence of ICT on knowledge sharing in research organizations in Kenya and will be a case study looking at the Centers for Disease Control and Prevention (CDC) Kenya. Kahinga (2014) highlighted the unique position public research organizations find themselves because although scientific research is generated, it has not been established whether this knowledge is shared among researchers.

1.1.1 Information and Communication Technology (ICT)

Information and communication technology (ICT) includes electronic technologies and methods employed to manage knowledge and information which includes information handling tools used to produce, store, process, distribute and exchange information (Joshi et al., 2013). Tamilselvan et al (2012) emphasize that ICT focuses on access to information through telecommunication thereby putting emphasis on communication technology. Studies have hypothesized that ICT tools, ICT structure, ICT infrastructure, ICT competency/ skills or know how as the major ICT features that influence knowledge sharing in organizations (Omona, van der Weide & Lubega, (2010), Hendriks (1999), Nguyo (2015).

ICT tools are key drivers for efficiency and effectiveness in knowledge sharing for competitive advantage and innovative use of these tools increase the quality and quantity of knowledge

shared (Nguyo, 2015). Oyier et al. (2015) highlighted that ICT has enabled private schools in Kenya audit teachers' skills and knowledge and therefore facilitate staff development. Mulwa (2012) operationalizes ICT infrastructure in the form of mobile network coverage together with intranet and internet connectivity. The author further stresses the importance of sources of energy such as standing generators, uninterruptible energy supply (UPS). DeSanctis and Poole (1994) posit that organizations can replicate the social structures that exist in terms of hierarchy when using ICT. This is seen in terms of administrative rights given to individuals depending on their positions within different working groups.

Information and communication technology (ICT) is therefore, crucial for an organization that is seeking excellence in its operations and the desire to reap the full rewards afforded by the knowledge sharing process. Rollet (2003) highlighted the need to look at knowledge from a people-oriented perspective that focuses on people and organizations or from a technology-oriented perspective that supports workers at an operational level. The technology-oriented perspective, advocates for information technologies used to provide knowledge required to perform a specific task as efficiently as possible and allows the smooth integration of knowledge tools and business management tools (Rollet, 2003). It is possible to conclude that the role of ICT in the creation, development, protection and distribution of an organization's knowledge asset cannot be underscored with this overview of ICT in mind.

There is an existence of association between ICT and knowledge sharing with ICT's main role being the connection of people with other people or with explicit knowledge (Van den Brink, 2003). Acceptance and use of ICT to improve and aid the management of knowledge has brought increased focus on the urgent need to come out for new methods, tools and techniques to promote effective management of knowledge and knowledge processes which include knowledge sharing for effective service delivery (Omona, Van der Weide & Lubega, 2010). Some of the problems that need to be considered in provision of ICT for knowledge sharing plans are receptiveness to user needs, content structure, quality requirements, ability to handle narrative, combination with existing systems, entrenching knowledge sharing in the work of staff seamlessly, scalability, hardware-software capability and synchronization (Denning, 2002).

Leveraging knowledge effectively requires ICT hence the development of technology based systems used to support the knowledge management processes that are commonly referred to as knowledge management systems (KMS) (Ali, Sulaiman, & Cob, 2013). Hendriks (1999) provides caution on the need to assess several variables by an organization when considering the relationship between ICT and any knowledge management process. These variables include the state of ICT infrastructure, the knowledge required to use ICT and other organizational factors. Three variables to be considered when reviewing technological factors that influence knowledge sharing are ICT tools, ICT infrastructure and ICT know-how (Syed Omar & Rowland, 2004). This study focused on the extent to which ICT tools, ICT infrastructure, ICT structure and ICT competency influence knowledge sharing at CDC Kenya.

1.1.2 Knowledge Sharing

Knowledge sharing is the deliberate use of an individual's ideas, understanding, resolutions, and experiences to another person directly or through an intercessor such as a computer-based system (Turban et al, 2005). Organizational knowledge provides an organization with the benefits that include leveraging core business competencies, hastening innovation and time to market, refininf cycle time and decision making (Fernandez & Sabherwal, 2010). A knowledge-intensive company is often valued at three to eight times its financial capital. Fernandez and Sabherwal (2010) put the importance of knowledge to a company into context by looking at Microsoft Company by highlighting the company's value at $282 billion with the valuation representing an estimation of its intellectual assets.

Even with developments made in the area of knowledge management, in practice, knowledge sharing continues to be difficult to implement for most organizations even though results of studies indicating that project teams completed their projects faster when they obtained existing knowledge from other units (Hansen, 2002). Kharabsheh, Bittel, Elnsour, Bettoni and Bernhard (2016) noted that despite investments in knowledge management, an estimated $31.5 billion are lost annually by Fortune 500 companies as a direct outcome of failing to share knowledge.

Different researchers have used different classifications to operationalize knowledge sharing. Lin and Lee (2004) focused on the know-how from work experience, knowledge obtained

informally and expertise gained from formal training. Bock and Kim (2002) also measured knowledge sharing by investigating how frequently people they knowledge through reports, official documents, manuals, methodologies, experience and expertise from training and education from other members. Knowledge sharing is operationalized by Yi (2009) as organizational communication through written reports, personal conversation, and shared databases.

Studies done on knowledge sharing have based their theoretical base on the social capital theory, the resource based theory and the technology acceptance theory (Nguyo, (2015), Nzui (2014). Social capital is loosely explained as the willingness to participate that is stimulated by the existing social relations and that can be structured to aid action (Adler & Kwon, 2002). Nahapiet and Ghoshal (1998) opine that conditions of knowledge creation and sharing are affected positively by social capital. Aslam et al, (2013) reiterates that norms and social cooperation are a key facilitator of knowledge sharing. The resource based theory has also been used in looking at organizational knowledge as a valuable resource that must be applied in an efficient way in order for the organization to record improved performance (Barney, 1991). The technology acceptance theory highlights perceived usefulness and perceived ease of use as variables that motivate users to adopt ICT (Karahanna & Straub, 1999; Koufaris, 2003; Wixom & Todd, 2005).

Mohamed, Murray and Mohammed (2010) in their study concluded that the role of ICT infrastructure to assist in amalgamating, analyzing, applying and distributing relevant knowledge, it is therefore important to align knowledge management activities with strong ICT infrastructure for sustainability. Developments in knowledge management has led to knowledge centered approach that is concerned with the collection and classification of knowledge and is dependent on information systems with success of managing knowledge heavily dependent on ICT application to bring appropriate knowledge to action (Van Der Velden, 2002). Mosoti and Masheka (2010) found in their study that organizations in Nairobi underutilize technology thereby not reaping the full benefits of knowledge management processes while Nguyo (2015) opines that organizations should define the outputs of knowledge sharing in instances where ICT is applied.

The key indicator in knowledge sharing is that the personal ambitions of knowledge sharers should match the group's ambition in order for ICT to be used to step up speed of knowledge transfer to workers (Hendrick, 1999). Management should create a culture of knowledge sharing if the advantages of ICT are to be seen by organizations. The main competitive priorities of knowledge sharing include employee development, cross functional cooperation and team work (Choy et al., 2006; Massingham, 2014). Knowledge sharing is a voluntary activity that requires employees to be well motivated in order to share the knowledge they have with their colleagues.

1.1.3 Overview of Centers for Disease Control and Prevention in Kenya

Research organizations can be organized under the public or private law and undertake to reinvest any profits from their research activities into efforts that promote development into new and existing areas of research (InnoviSCOP, 2016). The Centers for Disease Control and Prevention (CDC) is a unit of the U.S department of health and human services (HHS). CDC focuses at the national level on developing and implementing disease prevention and control, environmental health, health promotion and health education activities designed to improve the health of the people of the United States of America (USA) (CDC, 2017). Given the migratory nature of diseases; CDC has had to invest in operations in countries outside its national boundary because diseases can spread to the US as seen in the case of the Ebola outbreak that ravaged parts of West Africa with a few cases finding their way into the US.

In Kenya, CDC strives to motivate policies aimed at the protection and improvement of health in the country and the region through partnership, evidence based action and science (CDC, 2017). CDC has collaborated with Kenya Medical Research Institute (KEMRI) and the Kenya Ministry of health to build capacity in disease detection, prevention, and management for over 30 years. This has included investing in laboratory training and support to programs that work in the area of health research. CDC Kenya has different divisions that deal with different types of disease surveillance such as HIV, TB, and communicable diseases. The importance of knowledge sharing was especially highlighted during the Ebola virus disease outbreak of 2015 that took lives of over 11,000 people. Over two year of clinical and laboratory data from 20,000 patients that could have offered an expanded understanding of what is known about Ebola was

not utilized because an appropriate knowledge sharing framework was lacking (Delaunay et al., 2016).

The intensity of knowledge work done at CDC Kenya is highlighted in the organization's 2016 annual report where the organization responded to 30 public health outbreaks and with staff coauthoring and publishing 86 peer reviewed scientific articles and book chapters

Given the scope of work that CDC is involved in across the globe, it is important for the organization to adopt strategies that promotes knowledge sharing as it spreads its operations in new regions and countries. This will allow it to tap into the knowledge base that has been created for its years of operations and prevent the proverbial reinvention of the wheel when new medical phenomenon occur. The adoption of ICT is one of the strategy that has helped CDC Kenya be able to access the sophisticated knowledge databases that are already in existence in the headquarter offices in Atlanta. . This study determined the influence of ICT in knowledge sharing for the organization and established whether employees utilize the ICT elements for the intended purpose.

1.2 Statement of the Problem

Research organizations are considered as knowledge intensive in nature which calls for response strategies that guarantee that the knowledge available is known and used for the intended purpose through use of means that ensure that relevant people have contact with required knowledge in order for the organization to remain competitive (Innoviscop, 2016). Medical research organizations such as CDC Kenya respond to medical emergencies and previous experience like the Ebola outbreak of 2015 has shown that while knowledge is often available, knowledge sharing does not happen as expected leading to delays in responding to these outbreaks (Delaunay et al, 2016). Knowledge sharing has led to significant improvement in in industry research firms with improved products and services in firms such as Xerox and Apple, this has not been replicated in public research organizations because sharing of knowledge is limited among researchers (Kahinga, 2014).

Hendricks (1999) opines that ICT improves knowledge sharing by mitigating temporal and spatial barriers between knowledge workers and improves access to information and

knowledge. Nguyo (2015) found a positive correlation between ICT and knowledge sharing in state corporations in Kenya and further recommended the development of an integrated ICT and knowledge sharing policy framework with increased investment in ICT. Nzui (2014) carried out a case study of ICRAF Kenya which is not only a knowledge intensive organization but also a research organization. The author highlighted the need for further research focused on other research organizations in order to further understand the influence of ICT on knowledge sharing. Muhoya (2016) found that knowledge management processes like knowledge sharing is significantly aided by ICT and performance of global audit firms in Kenya is affected by how well this relationship is managed. Mosoti and Masheka (2010) reported results of their study that showed that technology continues to be under-utilized in most organizations in Nairobi therefore denying companies the rewards of knowledge sharing.

The government of Kenya through its Vision 2030 economic plan hopes to create a knowledge based economy which is largely contingent on the ability to create, use and share knowledge (Kenya Vision 2030, 2017). Despite growing attention to understand the influence of ICT on knowledge sharing, there is a need for work to be done in the context of knowledge intense organizations like research organizations (Nzui, 2014). This study expanded on the work done by Nzui (2014) and studied the influence of ICT with focus on the elements of tools, structure, competencies and infrastructure. It is in the backdrop of these gaps in understanding this relationship considering the importance of both variables that this study seeks to understand influence of ICT on knowledge sharing in research organizations with a specific focus on CDC Kenya because the organization provided the author an opportunity to study the relationship between the variables in their real life context (Schell, 1992).

1.3 Objectives of the Study

This study aimed at fulfilling the following objectives:

1.3.1 Main Objective

To investigate the influence of information and communication technology on knowledge sharing, a case of CDC Kenya.

1.3.2 Specific Objectives

The specifics of this study will be:

i. To determine the extent to which ICT tools affect knowledge sharing.
ii. To examine the extent to which ICT infrastructure influences knowledge sharing.
iii. To establish the extent to which ICT competencies affects knowledge sharing.
iv. To determine the extent to which ICT structure impacts knowledge sharing.

1.4 Research Questions

The research questions of this study were:

i. What is the effect of ICT tools on knowledge sharing?
ii. What is the influence of ICT hardware on knowledge sharing?
iii. What is the extent to which ICT skills affects knowledge sharing?
iv. What is the extent to which ICT structure impacts knowledge sharing?

1.5 Justification for the Study

Research organizations are knowledge and learning organizations that invest possible millions of dollars a year to create and develop existing knowledge. Research organizations are held in trust and rely on the good will of the general public to not only spend financial resources but also use knowledge to find solutions to everyday phenomenon. In this regard, ICT has been seen as a means to leverage challenges faced by traditional knowledge sharing methods.

This research is beneficial to research organizations on the strategies to employ so as to realize the benefits of knowledge sharing which will help them respond to emergencies and leverage on costs associated with traditional knowledge sharing strategies in particular. Key decision makers in research organization will appreciate the value of investing in ICT and hence make prudent budgetary allocations to support research organization efficient develop knowledge. It will specifically help these organizations identify, analyze and adopt ICT tools, develop ICT infrastructures, ICT structures and invest in ICT competencies that will steer them ahead in terms of achieving efficiency from knowledge sharing. Moreover, this study will add to the existing body of knowledge by filling the gap that exists in determining the effects of ICT on

knowledge sharing. Researchers and academicians can use data to expose further on the study topic.

1.6. Scope of the Study

The study investigated the influence of ICT on knowledge sharing. Specifically, the study focused on the influence of ICT tools, ICT infrastructure, ICT structures and ICT competencies on knowledge sharing in CDC Kenya. The study scope was the entire staff of CDC Kenya from the Nairobi office, Kisian and CRC offices in Kisumu. The study targeted administrative and professional staff of CDC Kenya and therefore support staff was not included in this study.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This particular section includes an evaluation of the literature pertinent the research by highlighting the knowledge that already exists in relation to the topic under study. It also provides theoretical framework, this includes theories previously used and are relevant to this study together with the empirical review which involves an analysis of the objectives. The research gap the study is attempting to fill will also be discussed together with a graphic presentation showing various variables and how they interact as well as the direction of the outcome in form of a conceptual framework. Lastly, this section has a summary of the literature review that further enhances existing knowledge gaps in the study.

2.2 Theoretical Review

Theories that guided the research are discussed in this section. The research is built on the following theories: resource-based view of the firm, social capital theory, and technology acceptance theory.

2.2.1 Resource-Based View of the Firm

This theory finds its basis on the belief that any firm that hopes to attain competitive advantage, must be able to effectively and efficiently apply its valuable resources which by extension leads to improved performance (Barney, 1991). Further study by Grant (1991) indicates that a firm's unique combination resources of all assets as well as the capability of the firm to use the said resources. In this view, organizational capabilities are also included as important feature to reflect when trying to comprehend the resource-based theory. Overall, organizations must build on their unique resource, skills, and capabilities with the aim of improving or controlling them in order to improve performance.

In the context of this theory, the most important resource that a research organization has is the knowledge available within its environment. Its ability to ensure that this knowledge is not only created but is also shared ensures that the organization is able to sustain economic rent through its ability to identify, develop and sustain this particular resource and distinguish it from that of similar players in the industry.

The resource-based view advocates that the differences in performance across firms are attributed to differences in efficiency rather than market power (Foss, Knudsen & Montgomery, 1995). The author further explores the difficulty that most firms have in evaluating the importance of resources in isolation which is attributed to the availability of assets that are complimentary. The value of a specific asset is likely to be at last partially contingent upon the presence or absence of another resource (Foss, Knudsen & Montgomery, 1995). We can, therefore, deduce from this the value accrued from the knowledge resource that exists in a research organization can be contingent to the existence of other assets or resources which in the context of this study is ICT that support the value creation from the availability of this primary resource.

Although the resource-based view has become popular, several scholars have pointed out that it overlooks the role of entrepreneurial strategies and abilities as important when looking at the performance of a firm (Burgelman, 1983). The limitation of this view has also been noted by Kraaijenbrink, Spender and Groen (2010) who points out the emphasis of possession of single resources and deficiency in acknowledgment of the prominence on bundling resources and participation of people in the creation of value. In this regard, it is therefore important for research organizations to be aware of the importance of other factors like presences of a skilled workforce, policies and process are important in boosting the performance of an organization. The research sought to clarify how the availability of ICT resource can contribute to an organization reaping the rewards of its knowledge resource.

2.2.2 Social Capital Theory

Knowledge sharing is not an exercise that an organization can induce through commercial but is rather a social process enabled by existing social capital (Mu, et al., 2008). Social capital is any resource that is derived from the network of relationships that exist within individual in any social unit (Fan &Wu, 2011).An organization should encourage the growth of norms and social cooperation are facilitators of knowledge sharing (Aslam et al, 2013, Adler &Kwon, 2002). The importance of social networks in creating an environment that is encouraging for

knowledge sharing is further emphasized by Nahapiet and Ghoshal (1998). The quality of knowledge shared in organizations is improved through social interaction (Chua, 2002).

Information and communication technology (ICT) competency provide an avenue for social interaction where the existence of the right ICT skills is an advantage to an organization that can be deployed in the use of networks, online brainstorming and web meetings as a form of social capital (Mark, et al, 2006). Adam and Urquhart, (2009) propose that the increased flow of information facilitated by ICT leads to the creation of social capital. There are three forms of social capital which are bonding, linking and bridging which can be achieved by deploying proper ICT infrastructure and ensuring organizations have the right skills to take advantage of all forms of social capital (Ho, 2013). Social capital theory delivers the skills, the rules or links, and trust that forms knowledge sharing networks (Nguyo, 2015). Established social capital is an important factor that has been recognized to facilitate knowledge sharing through avenues provided by technology like blogs, virtual communities and within organizations and teams (Fan & Wu, 2011).Therefore, it can be settled that social capital theory was relevant to the study at hand because of its emphasis of value creation through social interaction which is enhanced by ICT making the searching, accessing and sharing of knowledge easier for a knowledge intense organization like CDC Kenya.

2.2.3 Technology Acceptance Theory

Technology acceptance model (TAM) has been hailed among practitioners and academics as one of the most successful measurements of effective computer usage. The model's theoretical basis is founded on a customer behavior model called the theory of reasoned action used to stipulate the relationship in existence in the two variables namely the perceived usefulness and the perceived ease of use together with the users' attitudes, intentions and user computer adoption behavior (Warsaw, 1989).

Several research into the model has emphasized on detecting elements of key forecasters' mainly perceived ease of use and perceived usefulness (Karahanna and Straub, 1999; Wixom and Todd, 2005; Koufaris, 2003). Studies aimed at understanding this theory has led to development and expansion of TAM into TAM 2 and TAM 3 which have been used in the fields of online banking (Pikkarainen, 2004) and mobile commerce (Wu and Wang, 2005)

among others. Lee et al., 2003 echoes that TAM is thought as the most common and influential theory in information system based on existing empirical support.

The proponents of TAM highlight perceived usefulness and perceived ease of use as the most relevant variable for user acceptance with external variables such user characteristics, training, documentation, nature of task and system design. This implies that use of technology is motivated by perceived contribution that the technology has as far as improvement of performance of the work assigned to the said user. Taylor, (1992) concluded that customers will adopt a particular E-service if it meets their expectations as well as their perceived performance, which will lead to their satisfaction and in some instances lead to their willingness to recommend the company or purchase intentions. In this regard, employees in an organization will also highly adopt technology if they recognize it to be easy to use and they will be satisfied with the outcome.

On the other hand, if the particular technology is complicated and does not even give them the desired performance nor desired outcome, then the chances of being dissatisfied is very high. It is on the basis of this that the researcher adopted this theory with recognition that ICT should not only be made available but users must also perceive it to be easy to use and also be useful in helping them achieve efficiency that comes with knowledge sharing. Aligning ICT structures to existing organization structures is one way of ensuring that end users do not perceive the technology as complicated because it is simply reflecting what is already in existence. This eliminates the need for new rules and ensures social interaction that facilitates knowledge sharing is not undermined but rather enhanced by whatever technology is implemented in an organization.

2.3 Empirical Review

The following section provides an empirical literature on information and communication technology (ICT) elements and their relationship with knowledge sharing. The ICT elements include ICT tools, ICT infrastructure, ICT structure and ICT competencies.

2.3.1 Information and communication Technology Tools and knowledge sharing

Information and communication and technology (ICT) tools play an important role in knowledge management processes and are divided into five broad segments (Yusof & Ismail, 2012). These segments are namely office applications, groupware, document systems, work flow systems and analytical support systems. The first segment is the office applications which include email, messaging, calendaring and scheduling application. The second segment is made up of groupware which allows multiple individuals access and include databases, application sharing and electronic meeting systems. Document systems make up the third segment of ICT tools with digital document as the most prominent example. The fourth segment of is made up of work flow systems that includes workflow management systems, process support system and e-forms. The last segment is made up of analytical support systems that support decision making, data warehouse and knowledge systems that support portals, e-learning and knowledge sharing.

Omona, van der Weide and Lubega, (2010) outlined ICT tools to include knowledge portals, E-documents management system groupware, and data mining among many other. The authors further emphasized that the role of these data tools is mainly to create knowledge repository making it easy to search, access and share knowledge and the end help users to achieve intended goals. ICT tools are proposed to be important in development of knowledge databases or to support effective communication for knowledge sharing (Tong & Shaikh, 2014). It is imperative to t assess the needs of a project and then choose a tools that are known, easy to use, accessible and provide value when used (Guzman, 2007).Olasina (2012) opines that its important to find balance in the adoption of technology, process, people and content which are all influential for success on any knowledge management process utilization in Northern Nigeria.

Hendricks (1999) highlights that ICT tools primarily address data and information and not necessarily knowledge which is incorporated by policies that encourage people to get involved in the knowledge management process by adoption of ICT tools. ICT tools support effective communication which is a key ingredient for effective knowledge sharing purpose (Tong & Shaikh, 2014).

Information and communication and technology (ICT) tools including professional blogs hosted online, intranets, electronic mails (emails) and social networking platforms are a few examples that have witnessed an increased uptake compared to traditional methods for knowledge sharing (Anasi, Akpan & Adedokum, 2013). ICT tools enable replication for future reference by creating a shared knowledge base and adopting practices that professionals in different fields participate in by contributing their knowledge effectively and efficiently (Sulisworo, 2012).

Face-to-face communication over teleconferencing technologies that include but are not limited to desktop video conferencing tools are increasingly being adopted thereby creating and sustaining knowledge communities where conversations can take place virtually beyond the walls of the organization (Junnarkar & Brown, 1997). Knowledge managers should be in the front line in not only in the application ICT tools to access knowledge but to also support group collaboration and implement the means to help building interpersonal relationships so that the setting of individual expertise can be understood (Junnarkar & Brown, 1997).

2.3.2 Information and communication technology Infrastructure and knowledge sharing

Information and communication technology (ICT) infrastructure is the means by which existing shared computerized information systems in an organization is supported through existing physical facilities and services (Muda &Yusof, 2015). ICT infrastructure is further discussed by Muda and Yusof (2015) to consist of five aspects that include, hardware, software, and network and communication facilities. Computer network availability is a precondition for effective knowledge sharing (Nguyo, 2015).

The ICT infrastructure in current world must have a design that is entrenched with the abilities collaboration and cooperation in order to provide processing, connectivity and storage (Mohamed, Murray & Mohammed, 2010). Knowledge resides in people and the goal of ICT infrastructure is to increase socialization to encourage knowledge sharing among individuals. Computer networks that support knowledge sharing must be robust and dependable in order to provide a healthy diversity of knowledge sharing applications in order to attain customer requirements, timeliness and enhance efficiencies (Omona *et al*., 2010).

The predictors of ICT infrastructure are identified as hardware and software availability, internet connectivity and virtual work place availability as facilitators of knowledge sharing (Nguyo, 2015). The increased availability and use of intranet and the internet is an example of up to date ICT infrastructure which is encouraging increased adoption of ICTs for knowledge sharing (Anasi, Akpan & Adedokum, 2013). The effective management of an organizations knowledge resource depends on management ability to develop appropriate framework that allows for incorporation of organizational knowledge into organizational culture, ICT infrastructure, learning, insight and values (Sulisworo, 2012).

Information and communication technology (ICT) infrastructure including internet facilitates new organizational knowledge sharing with the best example seen through virtual knowledge teams (Hendricks, 1999). One of the ways that leadership can motivate knowledge sharing is by providing good ICT infrastructure to compliment forms of motivation that maybe employed to achieve the knowledge sharing objective (Yassin, Salim & Sahari, 2013). Software systems adopted by an organization are aimed at supporting organization processes of people who determin which type of information to access and share otherwise technology becomes a barrier to knowledge sharing when it fails to attain a close fit to employees' needs (BenMoussa, 2009).

Mulwa (2012) operationalized the indicators of ICT infrastructure to include connectivity, specifically internet, intranet and mobile phone connectivity. Additionally, availability of power or energy provided mostly by electricity, standing generators and uninterrupted energy supply (UPS) were discussed as ICT infrastructure aspects that determine the uptake of e-learning in secondary schools in Kenya. Mwangi (2017) further included access to ICT devices as an infrastructure factor that affects the uptake of ICT strategy in the health care sector in Kenya.

2.3.3 Information communication and technology competencies and knowledge sharing

In addressing technology barrier in knowledge sharing in an organization, Nzui (2014) recommends the need to encourage employees who are the ICT users to learn skills that will enable them to fully exploit ICT tools in their work. Nguyo (2015) supports the prospects of social capital theory and strongly upholds ICT skills as a social capital perspective of

knowledge sharing. The importance of user ICT skills was further highlighted by Kahinga (2014) when she identified lack of it as a factor in user failure to embrace modern ICT communications such as e-mails, blogs and intranet instead preferring traditional methods of presentation of findings.

Successful implementation of ICT to encourage knowledge sharing requires management to be aware that of technological barriers one of which is the lack of technical skills required to use available ICT resources which can be addressed through skills training (Toro & Joshi, 2013). This study will use ICT skills, ICT know how and ICT competencies interchangeably. Ofori-Dwumfuo and Kommey (2013) emphasize that with provision of ICT facilities and tools, management should organize regular trainings to educate staff on use of ICT on knowledge management processes which include knowledge sharing. The level of knowledge required for using ICT is a concern that needs to be addressed when looking at its role in knowledge management (Hendricks, 1999). In this light, research organizations must not only possess the right ICT tools, they must also have a workforce that possess the right skills and know how to use the ICT resources.

The relationship between ICT skills is discussed with ICT know how and ICT competency inferred and interchangeably used. Nguyo (2015) found that ICT skills are significantly and positively associated with knowledge sharing while other factors like trust and established organization norms are key as people are comfortable sharing knowledge in a familiar environment with people they trust.

The main aim of new ICTs is to facilitate the sharing of knowledge through common avenues and electronic storages which can be achieved through training and education to make the process of acquisition, storage and dissemination of knowledge easier (Soto-Acosta & Cegarra-Navarro, 2016). It can therefore be deduced that for ICT to be utilized, it is important for the proper ICT skills and knowledge to be acquire through training and education.

2.3.5 Information communication and technology Structure and knowledge sharing

Makatiani (2012) emphasizes on the need for organizations reliant on ICT to validate their technology application and develop an enterprise design that steers and support the

implementation of systems and application. Further, the implementation should have a clear long term strategy or plan to address adaptability and flexibility to changing business situations. The author further opines that poor planned ICT structure creates ICT infrastructure that is complicated, difficult to manage, expensive to maintain and a big waste of money to the organization.

Before the development of an advance technology, there are existing structures found in institutions such as hierarchies, organizational knowledge and standard operating procedures (DeSanctis & Poole, 1994). The authors opine that technology structures maybe produced so as to imitate the nontechnology organizational structures or changed, improved or joined with manual procedures thereby creating structures within the technology. The technology presents an assortment of social structures for use in interpersonal interactions and are instantiated in social life with sources of this structure for groups being the technology itself, the tasks or the organization environment.

DeSanctis and Poole (1994) observe ICT structure in three levels which are the level of restrictiveness, comprehensiveness of the technology and the level of sophistication. Restrictiveness support decision making, comprehensiveness provides a variety of features to users while the level of sophistication provides rule-writing capability in order for groups to develop and adopt procedures for collaborations. In addition, Wheeler and Valacich (1996) proposed that social interaction was affected by the process guidance of a structure, restrictiveness and communication mode. Nguyo (2015) underscored that alignment of ICT structure to organizational structure as a great way to improve knowledge sharing.

Organizations that align their ICT structure to existing organizations structure greatly improve the knowledge sharing process in the organization (Nguyo, 2015). Drastic change in the structure and conduct of system components in an organization is required for ICTs to help the organization to move from functional process oriented approach (Mohamed, Murray & Mohammed, 2010). Implementation of ICT for knowledge management presents risks that might endorse or reinforce organizational structures that obstruct the flow of knowledge and promote a belief that underscores the importance of individual experience (Hendricks, 2001).

2.4 Research Gap

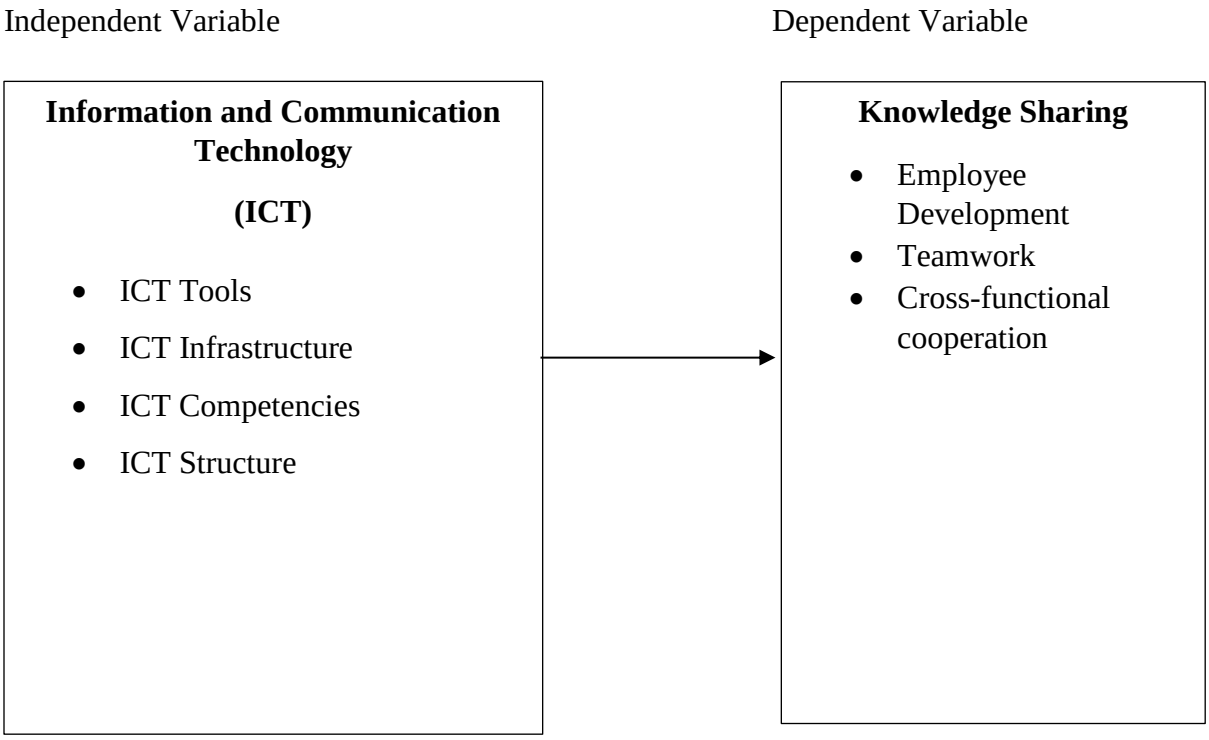
There are mixed empirical results on the relationship between Information and communication technology and knowledge sharing. There are authors who are in agreement that ICT has positive influence on knowledge sharing (Nguyo, 2015; Omona, van der Weide and Lubega, 2010; Tong & Shaikh, 2014; Yassin, Salim & Sahari, 2013). Other authors find that information and communication technology only synergistically influence knowledge sharing in organizations (Hendricks, 1999; Junnarkar & Brown, 1997; Sulisworo, 2012 Cheruiyot et al., 2012). There are also authors who point out to limited establishment of expected knowledge sharing output in existing body of work (Nguyo, 2015; Iqbal, Toulson & Tweet, 2015).

In the local context, Mosoti and Masheka (2010) content that while organizations in Nairobi have implemented KM programs, technology is underutilized as other factors such as culture, strategy and leadership are ignored in the process of developing ICT structure. There also exist a developing knowledge of the relationship between the variables researched in the education sector in Kenya (Mulwa, (2012); Oyier et al., (2015). The same cannot be said about research organization with Nzui (2014) in her assessment of the relationship in a research organization recommending similar research on the study variables in order to allow for generalization of results. This research sought to fill the empirical gap by providing basis on the influence of ICT on knowledge sharing in the context of a research organization operating in Kenya.

2.5 Conceptual Framework

The relationship between information and communication technology (ICT) and knowledge sharing is represented in the conceptual framework. The independent variable for the study is ICT. The dimensions used to measure ICT are ICT Tools, ICT Infrastructure, ICT Competencies, and ICT Structure. The dependent variable for the study is knowledge sharing and is measured by employee development, teamwork, and cross-functional cooperation.

Figure 2.1: Relationship between ICT and knowledge sharing



Source: Researcher (2018)

2.5.1 Operationalization

This subsection outlines how the researched measured information and communication technology and knowledge sharing.

Table 2.1: Operationalization of the variables

Variable	Operational Definition	How it is measured	Source
Independent Variable ICT Tools	Corporate Emails Web meeting e.g. Teleconferencing E-document management system Discussion Forums	5-point Likert scale to be used. (1=strongly disagree; 2=disagree; 3= somewhat agree;4 =agree; 5 = strongly agree).	Toro & Joshi (2013); Nguyo(2015); Omona et al., (2010)
ICT Infrastructure	Network availability Internet Connectivity Mobile network connectivity	5-point Likert scale to be used (1=strongly disagree; 2=disagree; 3= somewhat agree;4 =agree; 5 = strongly agree).	Mulwa (2012) ; Muda & Yusof (2015); Murray & Mohammed (2010)
ICT Competencies	Experience in ICT Training in ICT User guides	5-point Likert scale to be used (1=strongly disagree; 2=disagree; 3= somewhat agree;4 =agree; 5 = strongly agree).	Soto-Acosta & Cegarra-Navarro, 2016; Dwumfuo& Kommey (2013)
ICT Structure	Restrictiveness Level of Sophistication Comprehensiveness	5-point Likert scale to be used (1=strongly disagree; 2=disagree; 3= somewhat agree;4 =agree; 5 = strongly agree).	DeSanctis & Poole (1994); Wheeler & Valacich (1996); Nguyo (2015)
Dependent Variable Knowledge Sharing	Employee Development Teamwork Cross-functional cooperation	5-point Likert scale to be used (1=strongly disagree; 2=disagree; 3= somewhat agree;4 =agree; 5 = strongly agree).	(Sveiby, 1997); (Ghobadi& D'Ambra, 2012); (Soto-Acosta & Cegarra – Navorro, 2016); (Iqbal, Toulson & Tweet, 2015); (Wickramasinghe & Widyaratne, 2012).

Source: Researcher (2018)

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodologies that were used to carry out this research. It highlights the research philosophy, design, population, data collection, analysis, ethical considerations and research quality of this study.

3.2 Research Philosophy

This research adopted a positivism research philosophy. Positivism proposes that reality is made up of what is available to the senses i.e. what can be seen, touched, and smelt. An analysis should be based on scientific observation and finally natural and human sciences share common logical and methodological principles dealing with facts and not values (Gray, 2013). This implies that only factual knowledge is trustworthy (Bajpai, 2011). Positivism embraces the belief that there is a knowable reality that is independent of the research process and therefore relationships that are connected between variables can be identified, proven and explained (Hesse-Bider & Leavy, 2011).

Positivistic studies only require researchers to collect data and interpret it unlike the social constructionism philosophy that gives provision for human interest and subjection (Crowther & Lancaster, 2008). The characteristics of positivism include highly structured studies, large samples and quantitative measurements. Positivism also relies on theory to develop hypothesis to be tested during the research process (Easternby, Thorpe & Jackson, 2008).

3.3 Research Design

This study adopted descriptive research in order to provide for security against bias and encourage maximum reliability (Kothari, 2008). Descriptive studies aim to answer who, what, when and where questions (Coldwell & Herbst, 2004). It is also the best method for describing characteristics of the population and presents a picture of social setting of an organization without manipulating the environment (Nzui, 2014). Inferences were drawn through quantitative analytical techniques like spearman correlation and multiple regression from the data regarding existing relationships.

3.4 Population of Study

The target population of this research was employees of CDC in Kenya located in Nairobi and two locations in Kisumu, that is, the Kisian office and the CRC office. The number of employees is 172 therefore no sampling was conducted. The researcher used census survey which is defined as selection of all elements and cases in the universe that possess the information sought in a research (Orodho, 2003)

3.5 Data Collection

Data collection is defined as a procedure of gathering and measuring information in order to be able to answer questions that provoked the commissioning of the research work (Flick, 2009). Quantitative data was collected by use of a structured questionnaire with close-ended questions to collect quantitative data from respondents. Structured questions used likert scale that were used to measure different aspects of the variables under study.

The researcher used self-administered questionnaires to employees based in the Nairobi office. The researcher mailed the rest of the questionnaires to employees who are based in Kisumu. Collection of data was facilitated by first calling potential respondents and seeking permission to participate in the study. Those who agreed either received the physical form or had the questionnaire sent through their email address. The researcher made follow up phone calls after two weeks and sent email reminders to respondents based in Kisumu. Data collection was done for two months from March to April 2018 to allow for data collection.

3.6 Data Analysis

Meaningful information is obtained from any data when it is cleaned, coded and analyzed in a proper way (Mugenda & Mugenda, 2003). The researcher inspected data on the questionnaires upon receipt for completeness in the data analysis initial stage. Statistical Package for Social Sciences (SPSS) Version 23 was adopted for analysis of the relevant data to help establish relationships, trends and patterns and in order to understand and interpret the influence of the independent variable on the dependent variable. Pearson's (r) correlation was used to measure the strength of association between the independent and dependent variables. The study used multiple regression model as has been used in previous studies (Nguyo, 2015). The regression

equation adopted to test the relationship between the dependent and independent variables is represented as:

$$Y = \alpha + \beta_1 X_{1+} \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y: Knowledge Sharing

X_1 = ICT tools

X_2 = ICT infrastructure

X_3 = ICT competencies

X_4 = ICT structure

α = constant

β = coefficient of independent variables

ε = error term

The regression analysis examined the Coefficient of Determination (R^2) which indicated the degree the model fits. Coefficient of Determination is a value that lies between 0 and 1 and is a square of correlation coefficient (R). The closer the value is to 1 the better a fit the model is. The *p* – values were utilized to show the importance of the impact of the model and independent variables on the dependent variable.

3.7 Research Quality

Research quality is measured using the validity and reliability. Validity refers to how accurately the data obtained captures what it is purported to measure. An indicator is developed for the purpose of measuring a concept for measures that are genuine, which also means that the correct data and methods of research reflect the real problem or not (Bryman et al., 2007). Content validity was ensured by subjecting the collection instrument to a pilot test to check for any weaknesses in design and development of the questionnaire and then the final questionnaire will be developed. Reliability is the measure of how consistent a concept is. Reliability had the purpose of minimizing biases and error in the study, make the research as reliable as possible (Bryman et al., 2007). A pilot test was conducted to establish the reliability of the instrument which was measured using Cronbach's. The overall reliability of the

instrument was established at 0.711 as shown in Table 3.1. Tavakol and Dennick (2011) recommended a reliability coefficient of above 0.7 as adequate in research.

Table 3.1: Reliability score

Variable	Cronbach Value
ICT tools	0.711
ICT infrastructure	0.698
ICT competencies	0.702
ICT structure	0.812
Knowledge sharing	0.730
Overall reliability	0.711

Source: Survey Data

3.8 Ethical Consideration

The following considerations were incorporated in the research process. The research was conducted in an honest and objective manner. The data collected was used solely for academic purpose with this fact clearly communicated to the respondents. Confidentiality of the respondents was maintained by ensuring that their anonymity was protected in the analysis and presentation of data. The researcher sought to exclude any information that would easily identify any responded like the organization details specific to employees. Consent was sought from respondents ahead of their participation with the researcher reinforcing that participation is strictly voluntary and with utmost care taken to ensure no physical harm, embarrassment or discomfort occurred to respondents. Participants were made aware of their rights and protection and the right to withdraw from the process without any consequences was explained with participatory letter sent out to respondents outlining this fact (Akaranga & Makau, 2016).

CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presents analysis of data collected from respondents. The chapter is presented in sections of the response rate, demographic information, descriptive findings of information and communication technology (ICT), knowledge sharing, correlation analysis, regression analysis and summary of regression findings.

4.2 Response Rate

There were 12 questionnaires that were administered for the pilot study. During the study, 160 questionnaires were administered, from this, the researcher was able to get back 127 questionnaires that were used for analysis. The response rate for the study was therefore 79 percent which is adequate to make inferences from this research. Mundy (2002) note that a 60 % response rate might be acceptable, although 70 % would is preferable and 80 % desirable. This reveals that the response rate used for this research is acceptable and adequate.

4.3 Demographic Information

The researcher was interested in the background profile of the respondents. The results of the study shown in Table 4.1that respondents between 31-35 years had the largest representation in the sample as indicated by 45.7 %, this was followed by respondents between 25-30 years as shown by 25-30 years, 15.0 % were between 36-40 years, 12.6 % were above 50 years, and 6.3 % were 18-24 years. Majority of the respondents were female as represented by 61.4 % of the sample and men were represented at 38.6 %.

The study sought to establish the work experience of respondents at CDC, the results revealed that 47.2 % respondents had worked at CDC for 5-10 years, 32.3 % had worked for less than 5 years, and 20.5 % had 11-15 years' working experience at CDC Kenya. There are three CDC offices, the results show that 69.3 % respondents were from the Nairobi office, 18.9 % respondents were from Kisian office and 11.8 % respondents were from the CRC office. In terms of the educational level, Table 4.5 shows that 44.9 % of respondents had a Bachelor's level of education, 32.3. % had a Diploma level of education, 21.3 % had a Master's level of education, and 1.6 % respondents.

Table 4 1: Demographic Profile of Respondents

Age	**Frequency**	**Percent**
18-24 years	8	6.3
25-30 years	26	20.5
31-35 years	58	45.7
36-40 years	19	15.0
Above 50 years	16	12.6
Total	**127**	**100.0**
Gender	**Frequency**	**Percent**
Female	78	61.4
Male	49	38.6
Total	**127**	**100.0**
Work experience in years	**Frequency**	**Percent**
Below 5 years	41	32.3
5-10 years	60	47.2
11-15 years	26	20.5
Total	**127**	**100.0**
CDC Office	**Frequency**	**Percent**
CDC Nairobi Office	88	69.3
CDC Kisian Office	24	18.9
CDC CRC Office	15	11.8
Total	**127**	**100.0**
Education level	**Frequency**	**Percent**
Diploma level	41	32.3
Bachelors level	57	44.9
Masters' level	27	21.3
Other	2	1.6
Total	**127**	**100.0**

Source: Survey Data

4.4 Descriptive Statistics Analysis

Data analysis in terms of the descriptive statistics is presented in this section. Mean and standard deviation statistics were used to present the findings for each of the independent and dependent variables.

4.4.1 Information Communication Technology tools

The respondents were asked to indicate their degree of agreement with the four items in regard to information communication technology tools. Table 4.2 shows that the overall mean score was 4.43 and standard deviation of 0.594. This means that respondents agreed that ICT tools had an influence on knowledge sharing at CDC Kenya which suggests that the more ICT tools that the respondents are using the higher the knowledge sharing among staff.

Table 4.2: Information Communication Technology tools

	ICT tools	Mean	SD
a	Corporate Emails support effective communication for knowledge sharing	4.61	0.491
b	Web meetings like teleconferencing enhance knowledge sharing by providing an avenue for quick knowledge reference	4.53	0.501
c	E- Document management systems create a knowledge shared base for replication and future reference	4.34	0.799
d	Discussion forums accelerate knowledge sharing	4.24	0.587
	Overall mean score	4.43	0.594

Source: Survey Data

4.4.2 Information Communication Technology infrastructure

The respondents were asked to indicate how much they agreed with the four items in regard to information communication technology infrastructure. Table 4.3 shows that the overall mean score was 4.32 and standard deviation of 0.719. The results indicate that the respondents agree that the ICT infrastructure at CDC Kenya had a role to play in promoting knowledge sharing among staff members in the different CDC offices locations around the country.

Table 4.3: Information Communication Technology infrastructure

	ICT infrastructure	Mean	Standard Deviation
a	Network availability is a precondition for knowledge sharing at CDC Kenya	4.06	0.970
b	Internet connectivity improves knowledge sharing at CDC Kenya	4.53	0.700
c	Mobile connectivity is a convenient way of sharing knowledge virtually	4.38	0.487
	Overall mean score	4.32	0.719

Source: Survey Data

4.4.3 Information Communication Technology competencies

The respondents were asked to indicate their level of agreement with the four items in regard to information communication technology competencies. Table 4.4 shows that the overall mean score was 4.29 and standard deviation of 0.745. Findings show that respondents agree with the argument that skills and competencies of staff in ICT played a role in enhancing knowledge sharing among employees of CDC Kenya.

Table 4.4: Information Communication Technology competencies

	ICT infrastructure	Mean	Standard deviation
a	An employee's ICT experience enhances knowledge sharing	4.25	0.806
b	Training on ICT use is a method of enhancing the gain and dissemination of knowledge	4.43	0.637
c	Employees access to user guides improves usability of ICTs in the organisation	4.18	0.791
	Overall mean score	4.29	0.745

Source: Survey Data

4.4.4 Information Communication Technology structure

The respondents were asked to indicate their degree of agreement with the four items in relation to information communication technology structure. Table 4.5 shows that the overall mean score was 4.06 and a standard deviation of 0.821. The findings mean that the ICT structure at CD Kenya was a determinant for knowledge sharing among employees in the different locations around the country.

Table 4.5: Information Communication Technology structure descriptive statistics

	ICT structure	Mean	Standard deviation
a	The level of restrictions imposed on ICT users' influences knowledge sharing at CDC Kenya.	3.94	0.764
b	The level of ICT system sophistication in allowing new functions, upgrades, rules and content influences knowledge sharing at CDC Kenya.	3.98	0.917
c	The availability of comprehensive features and functionality for use by available ICTs allows for knowledge sharing at CDC Kenya	4.28	0.784
	Overall mean score	4.06	0.821

Source: Survey Data

4.7 Knowledge sharing

The respondents were asked to indicate their degree of agreement with the four items in relation to information communication technology structure. Table 4.6 shows that the overall mean score was 4.16 and a standard deviation of 0.832.

Table 4.6: Knowledge sharing descriptive statistics

	Knowledge sharing	Mean	Standard deviation
a	Employee development at CDC Kenya is enhanced because of ICTs available.	3.71	1.047
b	Team work is enhanced because of knowledge shared through ICT.	4.04	1.042
c	Cross-functional cooperation between different teams at CDC is made easy because of ICT.	4.54	0.588
d	In general, knowledge sharing is enhanced by ICT at CDC Kenya.	4.38	0.654
	Overall mean score	4.16	0.832

Source: Survey Data

4.6 Inferential results

The inferential statistics analysis is presented in this section. The study uses Pearson's (r) correlation and multiple regression analysis. Correlation analysis measures the strength of association between independent and dependent variables. Regression analysis measures direction and amount of effect independent variables have on dependent variable.

4.6.1 Correlation results

Table 4.7 presents the correlation results which show that there was a positive and significant relationship between ICT infrastructure and knowledge sharing (r=0.315, p=0.000) and ICT structure (r=0.648, p=0.000) and knowledge sharing. The findings revealed there was no relationship between ICT tools (r=0.052, p=0.561), and ICT competencies (r=0.174, p=0.051) and knowledge sharing.

Table 4.7: Correlation coefficients

		ICT tools	ICT infrastructure	ICT competencies	ICT structure
ICT tools	Pearson Correlation	1			
	Sig. (2-tailed)				
ICT infrastructure	Pearson Correlation	.646**	1		
	Sig. (2-tailed)	.000			
ICT competencies	Pearson Correlation	.257**	.232**	1	
	Sig. (2-tailed)	.004	.009		
ICT structure	Pearson Correlation	.356**	.466**	.387**	1
	Sig. (2-tailed)	.000	.000	.000	
Knowledge Sharing	Pearson Correlation	.052	.315**	.174	.648**
	Sig. (2-tailed)	.561	.000	.051	.000

** Correlation is significant at the 0.01 level (2-tailed).

Source: Survey Data

4.6.2 Regression analysis

The study conducted a regression analysis which confirmed that there was a positive relationship between ICT tools, ICT infrastructure, ICT competencies, ICT structure, and knowledge sharing.

Model 1

a. Dependent Variable: Knowledge sharing

b. All requested variables entered

Table 4.8 shows a summary of the Coefficient of Determination (R^2) values for each of the study independent variables (ICT tools, ICT infrastructure, ICT competencies, ICT structure). The results reveal that all the independent variables had a positive effect on knowledge sharing: ICT tools influenced 0.3 % of knowledge sharing, ICT infrastructure explained 9.9 %, ICT competencies explained 30 % of change, and ICT structure explained 41.9 % of change in knowledge sharing. The findings imply that independently, ICT structure and ICT competencies explained a relatively larger variation in knowledge sharing.

Table 4.8: Model summary [a]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
ICT tools	.052	.003	-.005	.70123
ICT infrastructure	.315	.099	.092	.66635
ICT competencies	.174	.030	.022	.69151
ICT structure	.648	.419	.415	.53507

Source: Survey data

Table 4.9 shows the summary of regression coefficients for each of the study independent variables (ICT tools, ICT infrastructure, ICT competencies, ICT structure). The findings show that each of the study independent variables had a positive effect on knowledge sharing. A unit increase in ICT infrastructure leads to a 0.401 increase in knowledge sharing and this was

statistically significant. A unit increase in ICT structure results to a 0.675 increase in knowledge sharing and this was statistically significant.

Table 4.9: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.787	.656		5.771	.000
	ICT tools	.086	.147	.052	.583	.561
	(Constant)	2.434	.470		5.177	.000
	ICT infrastructure	.401	.108	.315	3.715	.000
	(Constant)	3.098	.546		5.671	.000
	ICT competencies	.249	.127	.174	1.971	.051
	(Constant)	1.422	.293		4.855	.000
	ICT structure	.675	.071	.648	9.501	.000

Source: Survey data

4.6.3 Overall Regression Results

Table 4.10 shows the model summary where the R^2 shows indicates that the independent variables (ICT tools, ICT infrastructure, ICT competencies, ICT structure) explains 67.2 % of the variation in the dependent variable (knowledge sharing). This means that 32.8 % of variation in knowledge sharing is explained by other factors not investigated in this study.

Table 4.10: Model Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820[a]	.672	.466	.51109

Source: Survey Data

a. Dependent Variable: Knowledge Sharing

b. Predictors: (Constant), ICT structure, ICT tools, ICT competencies, ICT infrastructure

Table 4.11 indicates the ANOVA results from the multiple regression which indicates that the study model is significant (F = 28.485, p = 0.000, df = 4) in explaining the influence of ICT structure, ICT tools, ICT competencies, ICT infrastructure on knowledge sharing at CDC Kenya.

Table 4.11: ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	29.763	4	7.441	28.485	.000[b]
Residual	31.869	122	.261		
Total	61.632	126			

Source: Survey Data

a. Dependent Variable: Knowledge Sharing
b. Predictors: (Constant), ICT structure, ICT tools, ICT competencies, ICT infrastructure

Table 4.12 shows regression coefficients and also indicate that Variance Inflation Factor (VIF) values are all less than 5 which mean that there are no multicollinearity issues. The presence of multicollinearity among independent variables can affect the outcome of multivariate regression analysis. It is implied that associated regression coefficient are poorly estimated due to multicollinearity if any of the VIF values exceeds 5 or 10 (Montgomery, Peck, & Vining, 2001). The findings mean that an increase in ICT tools would lead to a decrease in knowledge sharing by -0.519 and this was significant (p = 0.000). A unit change in ICT infrastructure leads to a 0.272 increase in knowledge sharing and this was significant (p = 0.020). The results show that ICT competencies led to a -0.086 decrease in knowledge sharing and this was insignificant (p = 0.405). A unit change in ICT structure led to a 0.712 increase in knowledge sharing and this was significant (p = 0.000).

Table 4.12: Coefficients [b]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.761	.560		4.931	.000		
ICT tools	-.519	.142	-.314	-3.640	.000	.569	1.756
ICT infrastructure	.272	.115	.214	2.363	.020	.518	1.929
ICT competencies	-.086	.102	-.060	-.835	.405	.833	1.200
ICT structure	.712	.081	.683	8.772	.000	.699	1.430

Source: Survey Data

a. Dependent Variable: Knowledge Sharing
b. Predictors: (Constant), ICT structure, ICT tools, ICT competencies, ICT infrastructure

4.7 Summary of Regression Results

The results of the multiple regression analysis reveal that there was a positive and significant relationship between ICT infrastructure ($\beta = 0.272$, $p = 0.020$) and ICT structure ($\beta = 0.272$, $p = 0.020$) on knowledge sharing at CDC. ICT tools and ICT competencies were found to have a negative relationship with knowledge sharing implying that there was a decrease in knowledge sharing when the independent variable increases by one.

The proposed regression model was;

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$$

Where: Y: Knowledge Sharing

X1 = ICT tools

X2 = ICT infrastructure

X3 = ICT competencies

X4 = ICT structure

α = constant

β = coefficient of independent variables

ε = error term

The proposed regression model thus becomes;

$$\text{Knowledge sharing} = 2.761 + -0.519 + 0.272 + 0.712$$

Where;

2.761 = Constant value of knowledge sharing when all ICT variables are equal to zero.

-0.519 = Coefficient of ICT tools. This means that a unit increase in ICT tools leads to a decrease in knowledge sharing by a factor of 0.519, holding all other factors constant.

0.272 = Coefficient of ICT infrastructure. This means that a unit increase in ICT infrastructure leads to an increase in knowledge sharing by a factor of 0.272, holding all other factors constant.

0.712 = Coefficient of ICT structure. This means that a unit increase in ICT structure leads to an increase in knowledge sharing by a factor of 0.712, holding all other factors constant.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary and conclusions of the study findings. The implications of these conclusions for managers of research organizations are discussed. The researcher also presents the limitations of the complements suggestions for further research on the research subject.

5.2 Discussion of Findings

This section of the chapter presents the discussions of the findings based on the study research objectives.

5.2.1 ICT tools and knowledge sharing

The first objective of the study was to determine the extent to which ICT tools affect knowledge sharing. The respondents were presented with four statements and were asked to provide the extent of their agreement or disagreement on ICT tools influence on knowledge sharing. Descriptive statistics show that majority of the respondents agreed that emails supported effective communication for knowledge sharing at CDC. The correlation results revealed a positive but insignificant association between ICT tools and knowledge sharing. The regression coefficient results indicated that increasing ICT tools would lead to a reduction of the knowledge sharing process at CDC Kenya.

The descriptive findings show that staff agreed corporate Emails supported effective communication for knowledge sharing at CDC Kenya. This result supports Yusof and Ismail (2012) argument that ICT tools play an important role in knowledge management processes and are divided into five broad segments, one of which is office applications which include email, messaging, calendaring and scheduling application. ICT tools like professional blogs, electronic mails are being adopted when compared with traditional knowledge sharing methods (Anasi et al., 2013). The correlation and regression results show that there was an insignificant association between ICT tools and knowledge sharing.

This means the influence of ICT tools in knowledge sharing at CDC Kenya is not direct and may be mediated by other factors that were not included in this study but is explained in the literature review. Hendricks (1999) highlighted that ICT tools primarily address data and information and not necessarily knowledge which is incorporated by policies that encourage people to participate in the knowledge management process through the adoption of ICT tools. This means that having ICT tools only may not necessarily lead to knowledge sharing and therefore need for support through policies and strategies that incorporate people and organizational process for knowledge sharing to be optimized.

5.2.2 ICT infrastructure and knowledge sharing

The study's second objective sought to examine the extent to which ICT infrastructure influences knowledge sharing. The respondents were presented with three statements to which they were asked to provide their degree of agreement or disagreement with the influence of ICT infrastructure on knowledge sharing. Internet connectivity improves knowledge sharing at CDC Kenya had the highest mean score among these statements. A positive and significant association was seen between ICT infrastructure and knowledge sharing and this was confirmed by the regression coefficient results which showed that infrastructure leads to an increase in knowledge sharing and this was significant.

The descriptive findings show that availability of internet connectivity at CDC Kenya was a significant influence of ICT infrastructure to knowledge sharing. The inferential statistics revealed that ICT infrastructure had a significant association with knowledge sharing at CDC Kenya and regression results show that ICT infrastructure had a positive and significant effect on knowledge sharing. This study finding agrees with Anasi et al. (2013) who proposed that the access of organizational internet and intranet platform as examples of up to date ICT infrastructure which is on the increase encourages increased knowledge management workers to adopt ICT for knowledge sharing.

This study also supports past findings of Yassin et al., (2013) which found that one of the ways that leadership can motivate knowledge sharing is by providing good ICT infrastructure to compliment other forms of motivation that maybe employed to achieve the knowledge sharing objective. These findings agree and support findings from past studies like Nguyo (2015) who

found that ICT infrastructure influenced knowledge sharing among state corporations in Kenya. Similarly, Omona et al. (2012) found out that for knowledge sharing to succeed, ICT infrastructure and support must be reliable to enable diversity in Knowledge Sharing applications. Bataweel and Alsuraihi (2013) observed that an adequate ICT infrastructure is of paramount importance in creating, sharing and applying knowledge in organization and therefore sees ICT infrastructure as an enabler and a perfect solution to Knowledge Sharing.

5.2.3 ICT competencies and knowledge sharing

The study's third objective was to establish the extent to which ICT competencies affects knowledge sharing. The respondents were presented with three statements and were asked to provide their degree of disagreement or agreement on how much ICT competencies influence on knowledge sharing. The results indicated that of all the respondents, majority agreed that training to develop competencies on use of ICTs is a method of enhancing the gain and dissemination of knowledge at CDC Kenya. The correlation coefficients revealed no association between ICT competencies and knowledge sharing while the regression results confirmed that ICT competencies did not have an effect on knowledge sharing.

This study finding disagrees with past studies that have found a positive and significant association between ICT competencies and knowledge sharing. Kahinga (2014) stated that lack of ICT skills is a factor that affects knowledge sharing in an organization. The correlation show a positive but insignificant association between ICT competencies and knowledge sharing and a negative but insignificant effect of ICT competencies and knowledge sharing was also found in this study. Ofori-Dwumfuo and Kommey (2013) emphasize that with provision of ICT facilities and tools, management should intermittently organize training to educate staff on use of ICT on knowledge management processes which include knowledge sharing. This means that although staff may possess ICT competencies at CDC Kenya; there is need to integrate the competencies and access to ICT tools and facilities for staff at CDC Kenya to reap the rewards of knowledge sharing.

The descriptive statistics showed that staff perceived ICT training as an important component of ICT competencies development to promote knowledge sharing at CDC Kenya. This result supports Toro and Joshi (2013) statement that successful implementation of ICT to encourage

knowledge sharing requires management to be aware that of technological barriers one of which is the lack of technical skills required to use available ICT resources which can be addressed through skills training.

5.2.4 ICT structure and knowledge sharing

The fourth objective of the study was to determine the extent to which ICT structure impacts knowledge sharing. The respondents were presented with three statements which requested respondents to provide the extent to which they agree or disagreed with the influence of ICT structure on knowledge sharing. The availability of comprehensive features and functionality for use by available ICTs allows for knowledge sharing at CDC Kenya was found to be the highest ranked statement. A positive and significant association between ICT infrastructure and knowledge sharing was observed and was confirmed by the regression analysis which show that an increase in ICT structure led to an increase in knowledge sharing at CDC Kenya.

The findings show that most respondents agreed that availability of comprehensive features and functionality for use by available ICTs allows for knowledge sharing at CDC Kenya. These findings are in line with those of Nguyo (2015) who found that features and functionality available for use by users in ICTs significantly affects knowledge sharing. Makatiani (2012) emphasized on the need for every organization that relies on ICT to formalize their technology implementation and develop an enterprise design that steers and support the implementation of systems and application. The results show a positive and significant influence of ICT structure on knowledge sharing at CDC.

According to Zhang, Faerman, and Cresswell (2006), structural properties of various ICTs including restrictiveness, sophistication, and comprehensiveness affects the knowledge management systems and that alignment of ICT structure with the organization structure greatly improves knowledge sharing.

5.3 Conclusion

The first objective of the study was to determine the extent to which ICT tools affect knowledge sharing. The correlation results revealed that there was a positive but insignificant association between ICT tools and knowledge sharing. The regression coefficient results indicated that a

unit increase in ICT tools would lead to a decrease of knowledge sharing at CDC Kenya. The study therefore concludes that ICT tools do not have an effect on knowledge sharing at CDC Kenya.

The study's second objective was to examine the extent to which ICT infrastructure influences knowledge sharing. A positive and significant association was seen between ICT infrastructure and knowledge sharing and this was confirmed by the regression coefficient results which showed that infrastructure leads to an increase in knowledge sharing and this was significant. The study therefore concludes that ICT infrastructure had the second greatest effect on knowledge sharing at CDC Kenya.

The study also sought to establish the extent to which ICT competencies affects knowledge sharing as its third objective. The correlation coefficients revealed a positive but insignificant association between ICT competencies and knowledge sharing while the regression results show that ICT competencies led to a decrease in knowledge sharing and this was insignificant. The study therefore concludes that ICT competencies did not have an influence on knowledge sharing at CDC Kenya.

The final objective of the study was to determine the extent to which ICT structure impacts knowledge sharing. A positive and significant association between ICT infrastructure and knowledge sharing was observed and was confirmed by the regression analysis which show that an increase in ICT structure led to an increase in knowledge sharing at CDC Kenya. The study concludes that ICT structure had the greatest effect on knowledge sharing at CDC Kenya.

5.4 Recommendations

The study provides a number of recommendations. First, that research organizations should encourage staff to share information on emails at the workplace. This way, staff can always have a repository with which they can always retrieve information that they need in future. The availability of ICT tools in research organization should go hand in hand with measures to incorporate the research organization processes and knowledge workers in the knowledge management processes especially knowledge sharing. Managers should be aware that having ICT tools alone do not guarantee that knowledge sharing will be harnessed.

Secondly, ICT infrastructure cited as an important element for knowledge sharing should be taken up with zeal by research organizations. Budgetary allocations should be set aside to ensure both internet and intranet connectivity is always updated. This is because ICT infrastructure provides research organizations with the best opportunity to leverage its knowledge asset regardless of distance and time as it allows for continuation of work.

Finally, the study recommends that research organizations should integrate the ICT structures to the existing organizational structures by combining elements of the technologies, people, and processes to be in sync with overall organization objectives and encourage knowledge sharing. Given the importance of ICT in today's businesses and the intensity of the knowledge work that research organizations undertake, integration of ICT structure into organizational structure will streamline communication and accelerate knowledge sharing. The structures in the ICT investment should allow for functionalities to be added to address the changing needs of an organizations.

5.5 Limitations of the study

The research was faced with several limitations as is common with any research effort. First, this research is a case study that only looked at one research organizations. While the respondent rates are acceptable for generalization, the researcher is aware that other organizational factors that were not studied that could have influenced the outcome. Research organizations are dynamic and operate depending on their area of focus with the ICT uptake geared towards attainment of specific objectives of each organization. Secondly, while the organization in this study operates in Kenya, it is heavily influenced by the laws and policies of the parent organization in the United States of America. The type of ICT assets acquired and used is dictated by the headquarter office.

5.6 Suggestions for Further Study

The researcher makes suggestion for future research to be conducted in other research organizations that are not only based in Kenya but are home grown like the Kenya Medical Research Institute (KEMRI). This will help provide a better understanding of the influence of ICT on knowledge sharing in the Kenyan context. Multiple data collection approached which

can be qualitatively and quantitatively analyzed should be adopted in order to further explore this relationship.

The researcher further suggest for research to be conducted to understand how other organizational factors like motivation and organizational processes influence knowledge sharing in knowledge intense organizations like research organization and institutions of higher learning.

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APPENDICES

APPENDIX I: PARTICIPANT LETTER

Dear Participant,

I invite you to participate in a research study entitled 'Influence of Information and communication technology (ICT) on Knowledge Sharing in research organizations: A Case of Centers for Disease Control and Prevention (CDC) in Kenya. I am currently registered in the Master of Commerce Degree Program at Strathmore University and currently writing my Master's Thesis.

The attached questionnaire is designed to gather data on your opinion on ICT elements on knowledge sharing. You are voluntary requested to take part in this survey. The answers you give will remain private and unidentified. Information from this study will be kept under lock and key and will only be reported as a combined total. It's the researcher alone who will be aware of the individual answers to these questionnaires.

Please answer the questions on this questionnaire in the best of your knowledge if you agree to take part in this survey. This exercise is expected to only take a few minutes. Your participation is highly appreciated.

Yours Sincerely,

Margaret Wanjiku Mugo

APPENDIX 2: QUESTIONNAIRE FOR CDC KENYA STAFF

BACKGROUND INFORMATION

Section A: General Information

1. Please indicate which of the following age groups you belong to.

18-24 years	[ ]
25 – 30 years	[ ]
31-35 years	[ ]
36 – 40 years	[ ]
Above 40 years	[ ]

2. Gender

Female	[ ]
Male	[ ]

3. How long have you worked at CDC Kenya?

Below 5 year	[ ]
5-10 years	[ ]
11- 15 years	[ ]
16 – 20 years	[ ]
Above 20 years	[ ]

4. Which CDC Kenya offices are you based?

CDC Nairobi Office	[ ]
CDC Kisian Office	[ ]
CDC CRC office	[ ]

5. Please indicate your level of education.

High School Level	[ ]
Diploma Level	[ ]
Bachelors Level	[ ]
Masters Level	[ ]

Other (*Specify*) …….

Section B: ICT tools and knowledge sharing

On a scale of 1-5 where 1 = strongly disagree, 2= disagree, 3= Not sure 4 = agree and 5= strongly agree, Please indicate the extent to which you agree with the following statements as they relate to the ICT and knowledge sharing.

ICT tools		**1**	**2**	**3**	**4**	**5**
a	Corporate Emails support effective communication for knowledge sharing.					
b	Web meetings like teleconferencing enhance knowledge sharing by providing an avenue for quick knowledge reference.					
c	E- Document management systems create a knowledge shared base for replication and future reference.					
d	Discussion forums accelerate knowledge sharing.					

Section C: ICT infrastructure and knowledge sharing

On a scale of 1-5 where 1 = strongly disagree, 2= disagree, 3= Not sure 4 = agree and 5= strongly agree, Please indicate the extent to which you agree with the following statements as they relate to the ICT infrastructure and knowledge sharing.

ICT infrastructure		**1**	**2**	**3**	**4**	**5**
a	Network availability is a precondition for knowledge sharing at CDC Kenya					
b	Internet connectivity improves knowledge sharing at CDC Kenya					
c	Mobile connectivity is a convenient way of sharing knowledge virtually					

Section D: ICT competencies and knowledge sharing

On a scale of 1-5 where 1 = strongly disagree, 2= disagree, 3= Not sure 4 = agree and 5= strongly agree, Please indicate the extent to which you agree with the following statements as they relate to the ICT competencies and knowledge sharing.

ICT competencies		**1**	**2**	**3**	**4**	**5**
a	An employee's ICT experience enhances knowledge sharing					
b	Training on ICT use is a method of enhancing the gain and dissemination of knowledge					
c	Employees access to user guides improves usability of ICTs in the organisation					

Section E: ICT structure and knowledge sharing

On a scale of 1-5 where 1 = strongly disagree, 2= disagree, 3= Not sure 4 = agree and 5= strongly agree, Please indicate the extent to which you agree with the following statements as they relate to the ICT structure and knowledge sharing.

ICT structure		**1**	**2**	**3**	**4**	**5**
a	The level of restrictions imposed on ICT users' influences knowledge sharing at CDC Kenya.					
b	The level of ICT system sophistication in allowing new functions, upgrades, rules and content influences knowledge sharing at CDC Kenya.					
c	The availability of comprehensive features and functionality for use by available ICTs allows for knowledge sharing at CDC Kenya					

Section F: Knowledge sharing

On a scale of 1-5 where 1 = strongly disagree, 2= disagree, 3= Not sure 4 = agree and 5= strongly agree, Please indicate the extent to which you agree with the following statements as they relate to knowledge sharing at CDC Kenya.

Knowledge Sharing		**1**	**2**	**3**	**4**	**5**
a	Employee development at CDC Kenya is enhanced because of ICTs available.					
b	Team work is enhanced because of knowledge shared through ICT.					
c	Cross-functional cooperation between different teams at CDC is made easy because of ICT.					
d	In general, knowledge sharing is enhanced by ICT at CDC Kenya.					

Please indicate in the space below any other factors that affect knowledge sharing at CDC Kenya.

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THANK YOU VERY MUCH FOR YOUR TIME AND PARTICIPATION IN THE RESEARCH.